

We claim:

1. A compression locking arrangement for a door system disposed within a door portal aperture of a vehicle, said door system including at least one door having a sealing means and a  
5 door drive means having a prime mover with an output shaft connected to a drive spindle with a coupling means, said door drive means further having at least one door hanger attached to said at least one door, said at least one door hanger connected to a drive nut coupled to said drive spindle, said compression locking  
10 arrangement comprising a brake attached to one of said output shaft of said prime mover and said drive spindle for maintaining said at least one door in a first locked position, said brake maintaining a compression of said sealing means, said compression produced by said door drive means, said brake adapted for receiving at least  
15 one brake signal for an application and a release thereof.

2. A compression locking arrangement according to claim 1 wherein said compression locking arrangement further includes a first locking member adapted for attachment to one of said door  
20 drive means and said at least one door and a stationary lock mechanism disposed within said vehicle, said lock mechanism having a second locking member for engagement with said first locking member, said lock mechanism further having an unlocking means for disengaging said second locking member from said first locking  
25 member to enable movement of said at least one door in an opening

direction, said second locking member is fitted with a second locked position.

3 A compression locking arrangement according to claim 2  
5 wherein said lock mechanism is adapted for locking said at least one door in said second locked position and in a third locked position, said second locked position is at a second predetermined distance from said third locked position, said at least one door is adapted for manual movement between said second and said third  
10 locked positions to enable a passenger to withdraw one of a garment, body part and an object.

4 A compression locking arrangement according to claim 1  
wherein said compression locking arrangement further includes a  
15 manual release disposed within said vehicle, said manual release enabling release of said brake and disengagement of said second locking member from said first locking member.

5. A door system in a transit vehicle for at least partially covering and uncovering a door portal aperture of said transit vehicle, said door portal aperture having a first sealing means attached to at least one edge thereof, said door system comprising:  
20 (a) at least one door having a second sealing means disposed at a leading edge thereof;  
25 (b) a door drive means disposed within said transit vehicle

for moving said at least one door in an opening and a closing direction, said door drive means including:

- (i) a rotatable drive spindle;
- (ii) a prime mover connected to one end of said drive spindle with a coupling means, said prime mover enabling rotation of said drive spindle, said prime mover is adapted for receiving a prime signal, said prime mover enabling compression of said first sealing means with said second sealing means to establish a first locked position which is a substantially closed and locked position;
- (iii) a drive nut engaging said drive spindle;
- (iv) a drive guide member disposed substantially parallel to said drive spindle; and
- (v) at least one hanger bracket coupled to said drive guide means and to said at least one door, said at least one hanger bracket adapted for linear movement about said drive guide means; said at least one hanger bracket having a connection with said drive nut, said at least one hanger bracket enabling substantially linear movement of said drive nut upon rotation of said drive spindle in said closing and said opening directions, said at least one hanger bracket further enabling movement of said at least one door in said closing and said opening directions to at least

partially cover and uncover said door portal aperture;  
and

5 (c) a brake attached to one of an output shaft of said prime mover and said drive spindle for preventing rotation of said drive spindle, said brake maintaining said at least one door in said first locked position, said brake further maintaining said compression of said first and second sealing means, said brake adapted for receiving at least one brake signal for an application and a release thereof.

10

6. A door system for a transit vehicle according to claim 5 wherein said door system further includes a door control unit disposed within said transit vehicle for providing said prime signal to said prime mover and said at least one brake signal to 15 said brake, said door control unit further providing an unlock signal; said door control unit is adapted for receiving a door open signal and a door close signal and at least one position feedback signal and at least one annunciation signal.

20 7 A door system for a transit vehicle according to claim 5 wherein said brake includes:

(a) a stationary magnet;  
(b) an armature axially disposed at a predetermined air gap X from said stationary magnet, said armature is attracted by a force 25 of the magnetic field over said predetermined air gap X to said

magnet resulting in a frictionally engaged connection;

(c) a hub attached to said armature, said hub coupled to one of said prime mover shaft and said drive spindle to be rotated upon rotation thereof;

5 (d) at least one spring disposed between said armature and said hub; and

(e) a wiring connection for receiving said at least one brake signal.

10 8. A door system for a transit vehicle according to claim 5 wherein said door system further includes a redundant locking arrangement having:

(a) a first locking member engageable with one of said at least one hanger bracket and said at least one door;

15 (b) a stationary lock mechanism disposed within said transit vehicle, said stationary lock mechanism having a second locking member for engagement with said first locking member and an unlocking means for disengaging said second locking member from said first locking member to enable movement of said at least one door in said opening direction, said second locking member fitted 20 with a second locked position.

9. A door system for a transit vehicle according to claim 8, wherein said stationary lock mechanism provides a first 25 annunciation signal to said door control unit indicating an

engagement of said first locking member with said second locking member, said stationary lock mechanism is adapted to directly receive at least one zero speed signal indicating a predetermined speed of said transit vehicle.

5

10. A door system for a transit vehicle according to claim 8, wherein said a stationary lock mechanism having a pushback means including said second locking member fitted with a third locked position enabling said at least one door to be manually and 10 partially moved in said opening direction between said second locked position and said third locked position and further enabling a passenger to withdraw one of a garment, body part and an object captured by said first and said second sealing means.

15 11. A door system for a transit vehicle according to claim 5 wherein said door system further includes a manual release disposed within said transit vehicle for enabling manual unlocking of said at least one door by deenergizing said brake.

20 12. A door system for a transit vehicle according to claim 11 wherein said manual release is connected to said stationary locking mechanism with one of a cable and a lever, said manual release for disengaging said second locking member from said first locking member to enable movement of said at least one door in said opening 25 direction.

13. A door system for a transit vehicle according to claim 6  
wherein said door system further includes at least one first switch  
of a predetermined type disposed therein for one of providing a  
5 second annunciation signal to said door control unit indicating  
engagement with said at least one hanger bracket and indicating  
engagement of said first locking member with said second locking  
member, said second annunciation signal redundant to said first  
annunciation signal provided by said lock mechanism.

10

14. A door system for a transit vehicle according to claim 6  
wherein said door system further includes a second switch of a  
predetermined type disposed within said transit vehicle for  
providing a second brake signal to deenergize said brake for  
15 enabling movement of said at least one door in said opening  
direction.

15. A door system for a transit vehicle according to claim 14,  
wherein said second switch is disposed within said lock mechanism.

20

16. A door system for a transit vehicle, said door system  
comprising:  
  
(a) a first door having a first sealing means;  
  
(b) a second door having a second sealing means arranged  
25 complimentary to said first sealing means;

- R. 1.2.6
- (c) a drive means connected to said first and said second door for moving said first and said second door for covering and uncovering a door portal aperture; and
- (d) a brake attached to said drive means for locking said first and said second door in a first locked position, said brake maintaining compression of said first sealing means with said second sealing means.

17. A door system for a transit vehicle according to claim 16  
10 wherein said door system is selected from the group consisting of a sliding, pocket sliding, swing, and swing/sliding combination types.

18. A door system for a transit vehicle according to claim 5  
15 wherein said prime mover is selected from the group consisting of electric mover, pneumatic mover, and hydraulic mover.

19. 20. A method for determining failure of a brake in a transit vehicle door system by a door control unit, said method comprising  
20 the steps of:

- (a) at a beginning of movement of at least one door in an opening direction maintaining a first brake signal to energize said brake and providing a prime signal to energize a prime mover;
- (b) monitoring at least one door position by receiving at  
25. least one position feedback signal from an encoder disposed within

said door drive means; and

(c) thereafter annunciating said failure of said brake upon detecting an at least one door position change indicating movement of said at least one door in an opening direction.